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December 13, 2002

Via Electronic Filing
Marlene Dortch, Secretary
Federal Communications Commission
Washington, DC 20554

Re: Oral *Ex Parte* Presentation; WT Docket No. 01-309; RM-7658; Section 68.4(a) of the Commission's Rules Governing Hearing Aid Compatible Telephones

Dear Ms. Dortch:

The Hearing Industries Association ("HIA"), along with Self Help for Hard of Hearing People (SHHH) and the Alexander Graham Bell Association for the Deaf and Hard of Hearing (AG Bell), made separate oral presentations yesterday to Commissioner Kevin J. Martin and his Legal Advisor Samuel Feder and to Commissioner Michael J. Copps and his Legal Advisor Paul Margie. HIA was represented by: David E. Woodbury, Director of Government Relations; and Peter Tannenwald and Loretta Garcia, Counsel to HIA. Ms. Brenda Battat, Public Policy Director, represented SHHH, and Mac Gibson, Esq, General Counsel, represented AG Bell.

Attachment 1 summarizes the presentation made during the meetings. Attachment 2 is a 1996 report regarding hearing aid compatibility of wireless telephones. The parties discussed the commitments made by the wireless industry on pages 4-6. Mr. Woodbury demonstrated various hearing devices, including behind the ear and in-the-ear models. Ms. Battatt also left behind a folder containing materials about SHHH.

Please contact me if you have any questions about this meeting or the attachment.

Sincerely,

Loretta J. Garcia

Attachments

cc: (by electronic mail)
Honorable Kevin J. Martin
Honorable Michael J. Copps
Paul Margie, Esq, FCC
Samuel Feder, Esq, FCC
Qualex International

Hearing Aid Compatibility and Wireless Phones

WT Docket No. 01-309
December 12, 2002

I Two major consumer issues affecting mobile phones:

A. Compatibility with hearing aid telecoils – HAC Act solution;

B. RF interference to hearing aid from mobile phones – Section 255 solution.

II Progress toward industry solution

A. Hearing aid and phone manufacturers promised six years ago each to make a 15 dB improvement. Hearing aid manufacturers have done that.

B. Phone manufacturers need to comply with their promise to come half way on the solution. Note promises made in 1996 Steering Committee Report.

III HAC Act (Sec. 710 of Communications Act) requires removal of compatibility exemption when four factors are met:

1. It is in the public interest.
All Americans benefit when all consumers can use mobile phones – principle of universal service.

2. Continuing exemption would have adverse impact on consumers with hearing loss.
All consumers using hearing aids should be able to use mobile phones.

3. Compliance is technically feasible.
Phones that work with hearing aids are available.

4. Compliance would not increase costs to make products unmarketable.
Handsets that work with hearing aids are successfully marketed today.

IV What the FCC Can Do

A. Remove HAC exemption for wireless phones.

B. Set a date certain and move toward compatibility, with transition period if necessary.

C. Enforce Section 255 to resolve interference problems.

May 16, 1996

Reed E. Hundt
Chairman
Federal Communications Commission
1919 M Street, N.W.
Room 814
Washington, D.C. 20554

Re: Report of the Steering Committee of the Hearing Aid Compatibility and Accessibility to Digital Wireless Telecommunications Summit Meeting

Dear Chairman Hundt:

On behalf of the Steering Committee of the Hearing Aid Compatibility and Accessibility to Digital Wireless Telecommunications Summit Meeting, I am pleased to submit this report outlining the progress that has been achieved through the Summit process to improve the accessibility of digital wireless telephones to people with hearing loss, including people who wear hearing aids. One of the benefits of the process has been increased awareness about consumer needs and the limits of existing technology.

As you know, the Steering Committee was formed in the fall of 1995 to continue and formalize discussions among the three key affected interests -- organizations representing people with hearing loss, hearing aid manufacturers, and the digital wireless telephone industry -- and to organize a Summit Meeting to bring together experts in the fields of hearing loss and digital wireless technology to begin to identify potential accessibility solutions. The Steering Committee is comprised of representatives of the Alexander Graham Bell Association for the Deaf, the American Academy of Audiology, the Cellular Telecommunications Industry Association, the Hearing Industries Association, the PCS 1900 Group, the Personal Communications Industry Association, and Self Help for Hard of Hearing People, Inc.

The Summit Meeting was held on January 3-4, 1996, in Washington, D.C. At the Summit Meeting, three working groups were formed to address specific interference and accessibility issues. The three working groups, which were co-chaired by representatives of each of the three main interest groups, were the Short-Term User and Bystander Interference Working Group, the Long-Term User and Bystander Interference Group, and the Hearing Aid

Compatibility Working Group. The three Working Groups have continued to meet following the Summit Meeting and have submitted to the Steering Committee reports summarizing their research and conclusions. Copies of the reports of the Short- and Long-Term Groups are attached. The report of the Compatibility Group currently is under review, and a copy will be submitted shortly under separate cover.

Based on the results of the work of the three Working Groups, as well as additional, separate research, the Steering Committee held several meetings to develop a framework for resolution of the interference and accessibility issues. While agreement was reached on some issues, areas of disagreement remain. Statements are attached from the digital wireless industry, the hearing aid industry, consumers represented by their organizations, and the American Academy of Audiology.

The Steering Committee welcomes your views on the results of the Summit process.

Sincerely,

Pamela J. Ransom
Summit Facilitator

Enclosures

cc: Karen Brinkmann
Dr. Elizabeth Jacobson

May 10, 1996

STATEMENT OF THE DIGITAL WIRELESS TELEPHONE INDUSTRY

On behalf of the digital wireless telephone industry, the Cellular Telecommunications Industry Association, the Personal Communications Industry Association, and the PCS 1900 Group[1/] have prepared this statement to outline their perspective on the accomplishments of the Hearing Aid Compatibility and Accessibility to Digital Wireless Telecommunications Summit process. As set forth below, the digital wireless industry believes that the process has been a productive one that has forged new, cooperative relationships among consumer representatives, hearing aid manufacturers, and the digital wireless telephone industry, and has led to a path for resolving the interference caused by digital wireless telephones to hearing aids and ensuring that people with hearing loss have greater access to digital wireless telephones. The digital wireless telephone industry believes that its attached proposal for resolving the interference and accessibility issues represents a far-reaching, responsible, and pro-active response to these important issues, and the industry accordingly is prepared to implement the workplan set forth in that proposal.

I. BACKGROUND

Digital wireless telephones are being introduced in the United States using a variety of different operating standards, including Time Division Multiple Access, PCS 1900, Code Division Multiple Access, and other standards. At the same time that digital wireless technology offers important benefits, such as improved sound quality, the transition to digital technology presents serious challenges. In particular, the industry is aware and concerned that some digital wireless telephones interfere with some hearing aids. There have been claims that some bystanders experience interference in close proximity to digital wireless telephones used by others. Preliminary data from the University of Oklahoma Center for the Study of Wireless Electromagnetic Compatibility indicate that bystander interference in general is not a significant problem; however, further evaluation is needed. The industry also is concerned that, in addition to the interference problem, digital wireless phones may not be fully accessible to some people with hearing loss because those phones are not compatible with some hearing aids.

1/ The PCS 1900 Group is comprised of providers, manufacturers, and suppliers of digital wireless services and equipment in North America using the operating standard known as PCS 1900. The members of the PCS 1900 Group are: American Personal Communications; BellSouth Personal Communications, Inc.; Ericsson Inc.; Motorola, Inc.; Nokia, Inc.; Northern Telecom Inc. (Nortel); Omnipoint Communications, Inc.; Pacific Bell Mobile Services; Powertel PCS Partners, L.P.; Siemens Stromberg-Carlson; and Western Wireless Corporation.

The digital wireless industry is committed to solving these problems and to ensuring that people with hearing loss, including hearing aid wearers, can enjoy the benefits of digital wireless technology. In 1994, CTIA helped to create, and the wireless industry has funded, the University of Oklahoma Center for the Study of Wireless Electromagnetic Compatibility, an independent research and educational facility established to address electromagnetic compatibility and interaction with wireless telecommunications devices. Various companies in the industry also have pursued, and continue to pursue, individual research in an effort to resolve the interference and accessibility issues. For example, Pacific Bell Mobile Services and Ericsson Inc. currently are working with Self Help for Hard of Hearing People to deliver digital wireless handsets with reduced interference and enhanced accessibility by the first quarter of 1997.

In October 1995 when Chairman Hundt asked representatives of the digital wireless industry to suggest a process for resolving these issues cooperatively, the industry readily accepted the challenge. The process that the industry proposed was to work with the other key affected interests -- organizations representing people with hearing loss and hearing aid manufacturers -- to organize a Summit Meeting and to form working groups to address the key technical issues. After a Steering Committee was formed that included representatives of consumer organizations, the hearing aid manufacturing industry, and the digital wireless industry, the digital wireless industry funded and co-sponsored the January 3-4, 1996 Hearing Aid Compatibility and Accessibility to Digital Wireless Telecommunications Summit Meeting and played an active role in each of the three working groups formed at the Summit.

As set forth below, the industry believes that the Summit process has met its goals of improving mutual understanding of the needs and interests of consumers, hearing aid manufacturers, and the digital wireless industry, and providing a forum for identifying and evaluating the feasibility and impact of potential solutions to interference and accessibility concerns.

II. COMMON GROUND

Based on the reports of the working groups and substantial research conducted separately by various of the digital wireless companies, the Steering Committee achieved a common understanding on a number of the elements of a workplan for resolving the interference and accessibility issues. This understanding encompasses at least the following general matters:

1. Need To Modify Both Phones and Hearing Aids. The interference and accessibility problems can be solved only through a combination of both modifications to handset design and improvement of hearing aid immunity to RF emissions. Engineers from the digital wireless industry and the hearing aid industry already are working together to

ensure that these modifications are accomplished in a coordinated manner.

2. Need for Additional Research. Further research and continued dialogue among technical experts is critical in order to resolve the interference and accessibility issues. This research must include identifying the objective level of interference that hearing aid wearers can experience comfortably with digital wireless telephones. To that end, the digital wireless industry is funding and participating in a study to be conducted by Mead C. Killion, Ph.D., Chief Executive Officer of Etymotic Research of Elk Grove Village, Illinois, and a Professor of Audiology at Northwestern University. Another study is being conducted by Harry Levitt, Ph.D., of the Rehabilitation Engineering Research Center (RERC) on Hearing Enhancement and Assistive Devices, Lexington Center, in Jackson Heights, New York, and a Professor at the Graduate School of the City University of New York. In addition, Phase II of the research being conducted at the University of Oklahoma EMC Center has as its objectives the development of hearing aid immunity and phone emission standards, the investigation of short- and long-term solutions, laboratory and hearing aid user tests, and the investigation of typical use phone conditions.

   The parties have agreed that technical experts will review the data to be compiled in these and other studies, and reach a preliminary consensus on the objective level of interference that hearing aid wearers can experience comfortably with digital wireless telephones. Thereafter, the experts will develop a preliminary matrix with recommended performance targets for hearing aid immunity and electromagnetic emission levels that will serve as an interim benchmark. The parties have agreed that the preliminary matrix will be submitted to appropriate standards bodies for incorporation in applicable standards.

   In addition, the parties agree that there is a need to continue to investigate the feasibility of achieving accessibility through internal coupling of digital wireless telephones to hearing aid telecoils, which are in approximately 20-30% of existing hearing aids. This research already is underway at various companies in the digital wireless telephone and hearing aid manufacturing industries.

3. Importance of Consumer Choice. Based on the recognition that there are many different kinds of hearing loss, that digital wireless telephones are personal devices, and that there may be many different

potential solutions to the interference and accessibility problems, there needs to be a range of options for people with different levels of hearing loss and different needs. There is no single, universal solution.

4. Role of Education. Consumer support groups, audiologists, and the digital wireless industry need to carry out technical assistance and education programs, and conduct other outreach efforts, to facilitate consumer understanding and enhance access.

5. Phased-in Approach. In light of the constraints of existing technology, the need for additional scientific research on the objective level of interference, and practical concerns, modifications to digital wireless telephones and improvements to hearing aid immunity must be phased in over a reasonable period of time. Thus, interim solutions will precede longer-term solutions to the interference and accessibility issues.

III. THE DIGITAL WIRELESS INDUSTRY'S PROPOSAL

The attached proposal of the digital wireless telephone industry builds on the common ground set forth above. Under this proposal, the industry would ensure that, to the extent that it is readily achievable,[2/] there is a representative cross-section of digital wireless telephones that, through features integral to the telephones, mitigate interference and are accessible to people with hearing loss, including people who wear hearing aids. Assuming timely completion of the interference studies on which these modifications would be based, these phones would be commercially available in less than two years. This proposal is dependent on significant additional technical research, some of which already is underway.

The key elements of the digital wireless industry's proposed workplan, which is attached to this Statement in its entirety, are the following:

1. Education. Consumer support groups and the digital wireless industry will initiate or continue technical assistance and education programs on interference and accessibility issues. The digital wireless industry's educational program will be based largely on the Communications Plan developed by the Education Subcommittee of the Short-Term

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[2/] In light of technical and economic constraints, the digital wireless telephone industry can agree to modify telephones only to the extent that doing so is readily achievable. The "readily achievable" standard is the same standard that is used in Section 255 of the Telecommunications Act of 1996.

User and Bystander Interference Working Group. The digital wireless industry also will continue to engage in outreach efforts to facilitate access to digital wireless telephones by people with hearing loss. The American Academy of Audiology will educate audiologists and consumers about electromagnetic interference and accessibility considerations as well.

2. Interference Studies. Technical experts identified by the parties will compile the results of studies undertaken to identify an objective level of interference that hearing aid wearers can experience comfortably with digital wireless telephones; the industry anticipates that the researchers that it is sponsoring will complete such studies by July 31, 1996. Based on a preliminary consensus on the level of acceptable interference, within two months technical experts will develop a preliminary matrix with recommended performance targets for hearing aid immunity and electromagnetic emission levels; this preliminary matrix will serve as an interim benchmark. Thereafter, the preliminary matrix will be submitted expeditiously to the appropriate standards bodies for incorporation in applicable standards.

3. Interim Digital Wireless Telephone Solutions. Within eight months of the completion of the interference studies, and to the extent that it is readily achievable, the digital wireless industry will have in place either interim or permanent solutions that will keep interference at or below the benchmark level and enhance accessibility. Specifically, to the extent that it is readily achievable, there will be a variety of digital wireless telephones that have features, both internal and external, that are integral to the design of the telephone and that may include, but will not be limited to, a range of accessories, circuitry changes, changed antenna positions, and/or reduced magnetic emissions. Providers and manufacturers also will offer options to provide accessibility, and service providers will work with individuals with hearing loss in the manner that service providers deem appropriate to provide accessibility to digital wireless telephones.

4. Commercial Availability of Long-Term Digital Wireless Telephone Solutions. Within twenty months of the completion of the interference studies, and to the extent that it is readily achievable, a representative cross-section of digital wireless phones will be manufactured and commercially available with features that are integral to the design of the telephone, including built-in features, and that limit interference to the benchmark level. These modifications will be made in parallel with improvements to hearing aid immunity. In addition, a representative cross-section of digital wireless phones will have

features that are integral to the design of the phone or otherwise that provide accessibility.

5. Improved Hearing Aid Immunity. Within the same twenty month period, and to the extent that it is technologically feasible, a representative cross-section of hearing aids sold in the United States will be available with built-in immunity to electromagnetic interference in conformance with standards currently under development.

6. Continued Research. The digital wireless telephone industry commits to continue research to enhance accessibility. This research includes continuing to investigate the feasibility of achieving compatibility through internal coupling of digital wireless telephones to the hearing aid telecoil, and testing proposed accessibility solutions against a wide range of hearing aids of various immunity levels.

7. Bystander Interference. In the event that research demonstrates that bystander interference from digital wireless telephones exceeds the objective level of interference, and to the extent that it is readily achievable, the digital wireless industry, working with hearing aid manufacturers, will seek to mitigate that interference.

8. Consumer Choice. The industry's proposal recognizes that people with hearing loss, like all consumers, desire access to the broadest possible range of digital wireless telephones, and they should not be limited to only the most expensive and feature-rich, or the most basic and inexpensive, units.

9. Interfaces With Other Devices. The industry commits to investigate the feasibility of standardizing access connections to digital wireless telephones. This of course assumes that the digital wireless industry will have the cooperation of the manufacturers of the other devices at issue in conducting this research.

We understand that this proposal has the full support of the hearing aid manufacturing industry. However, representatives of consumer organizations have agreed fully only to the provisions relating to educational programs and to significant aspects of the provisions relating to the interference studies. We have received no feedback from the American Academy of Audiology on this or our prior proposal.

IV. AREAS OF DISAGREEMENT

Despite extensive discussions among the Steering Committee members, four critical areas of disagreement remain. Although the digital wireless telephone industry believes that it understands the basis for the consumer representatives' positions with respect to these four issues, the industry has concluded that the commitments sought from the industry by the consumers are not technically or practically feasible, would be unduly burdensome, and/or are unjustified in light of the substantial commitments that the industry already is willing to make. Those four areas of disagreement are the following:

1. Telecoil Compatibility. Technical constraints make it impossible at this time to provide universal, built-in telecoil compatibility, as currently defined in Part 68 of the FCC's rules, and the industry therefore has not been able to accede to the consumers' request on this point. These requirements originally were developed for wireline phones and are not directly applicable to the technology being used by digital wireless phones that are themselves inherently personal devices. Further, there is some evidence that, as currently written, the direct application of these requirements would provide inferior access to digital wireless phones for people with hearing loss.

   Substantial research is being conducted by various engineering groups. Our engineers have concluded that, using existing technology, building in universal telecoil compatibility, as currently defined in Part 68, is not feasible for reasons of signal to noise ratio within the defined limits, battery life, phone size, and other reasons. We are committed to providing access to people with hearing loss and are prepared to continue and in fact are continuing technical research on the compatibility issue. We believe that it would be prudent to revisit this issue in the future when these research efforts have progressed to a more mature state. In the meantime, service providers will work with consumers with hearing loss in the manner that service providers deem appropriate to provide accessibility to digital wireless phones.

2. Universal, Built-in Availability of Interference-Limiting and Accessibility Features. The digital wireless industry cannot agree that every single digital wireless telephone by every single manufacturer will contain built-in features to ensure accessibility and limit interference. We have made clear for some time, however, that digital wireless telephone manufacturers will provide a representative cross-section of solutions that facilitate access and consumer choice by persons with hearing loss, including both telecoil and non-telecoil hearing aid wearers. Particularly since digital wireless telephones are personal communications devices, and in order to ensure consumer

choice, acceding to the consumer representatives' request would diminish, if not eliminate, consumer choice and amount to overkill. We do not think that this extreme approach is in the public interest or needed to satisfy the accessibility and useability goals of Section 255 of the Telecommunications Act of 1996.

3. Timing of Solutions to Bystander Interference. The consumer representatives have requested that the digital wireless industry commit to solve bystander interference to existing hearing aids within a specified time period, such as within twenty months of the completion of the interference studies. The digital wireless industry is concerned about claims that some bystanders experience interference in close proximity to digital wireless telephones used by others, but research to date has indicated that bystander interference in general is not a significant problem. Specifically, on April 29, 1996, the University of Oklahoma EMC Center announced that preliminary data showed that, with digital wireless phones tested in their worst-case interference mode, the average threshold distance when a hearing aid user perceived any interference (not necessarily annoying) was less than one meter (3.3 feet) between the hearing aid and the wireless phone. The data further showed that, on the average, hearing aid users did not experience annoying interference unless the phones were within two feet of the hearing aid. Continued evaluation of the extent of a bystander interference problem is necessary, however, and is underway.

   To the extent a serious bystander interference problem ultimately is determined to exist, agreeing to set a specific, near-term time frame for solving that problem is complicated by several factors. First, the magnitude of the problem has not yet been identified. Second, solutions will be highly dependent on work to be done by hearing aid manufacturers to increase hearing aid immunity. Third, existing hearing aids with low immunity will remain in use for several years. The digital wireless industry is committed to working with hearing aid manufacturers to seek to mitigate bystander interference that exceeds the objective level to be determined through the interference studies, if bystander interference should prove to be a significant issue.

4. Establishment of a Fund. The consumer representatives have requested that "all wireless interests doing business in the United States" establish and finance a fund to replace or retrofit hearing aids for users and bystanders; specifically, the consumer representatives propose full funding for hearing aids purchased within the past six years and partial funding for older hearing aids. The digital wireless

telephone industry cannot agree to establish such a fund. Aside from the vagueness of the consumers' proposal and the extraordinary difficulty of administering such a program, the industry does not believe that such a fund is responsive to any legitimate consumer need, particularly in view of the aggressive timetable set forth in the proposed workplan. Furthermore, given the rapid timetable for increasing hearing aid immunity and reducing interference to hearing aids from digital wireless phones that the industry has proposed, such a fund is not necessary.

V. FUTURE ACTIVITIES

Although the digital wireless industry clearly would have preferred to have reached consensus with all of the members of the Steering Committee on a comprehensive workplan for resolving the interference and accessibility issues, it appears that consensus on all elements of such a workplan is not possible at this time. In large measure, the inability of the industry to provide all of the solutions requested by the consumer representatives is due to the state of existing technology. We therefore are committed to conduct further technical research in the hope that we soon will be in a position to offer people with hearing loss more and better solutions. In addition, we hope that we can maintain an ongoing dialogue with each of the members of the Steering Committee as we work to find those solutions.

In the meantime, however, the industry is prepared to implement its proposal voluntarily in order to expedite the process of bringing digital wireless phones to market that have reduced interference and enhanced accessibility. We understand that the hearing aid manufacturing industry also is prepared to implement the provisions of the proposed workplan regarding improved hearing aid immunity. We strongly believe that the proposed workplan is a responsible, pro-active, and forward-looking approach to addressing the interference and accessibility issues that will help ensure greater access to digital wireless technology for people with hearing loss, including people who wear hearing aids. As we proceed to implement our proposed workplan, however, we need guidance from the FCC as to its intentions in this area.

We would be pleased to discuss our proposal with the FCC, the FDA, the Architectural and Transportation Barriers Compliance Board, and other interested parties.

REVISED PROPOSAL -- April 29, 1996

PROPOSAL OF THE DIGITAL WIRELESS INDUSTRY

The following is the revised proposal of the digital wireless telephone industry (the PCS 1900 Group, CTIA, and PCIA) to mitigate interference caused by digital wireless telephones to hearing aids and to provide increased accessibility of digital wireless telephones to people with hearing loss. Implementation of the following workplan will be pursued in such a manner as to encourage the use of currently available technology and in a manner that does not discourage or impair the development of improved technology.

PROPOSED WORKPLAN

I. EDUCATION (Ongoing)

A. Consumer support groups will initiate or continue technical assistance and education programs on interference and accessibility issues relating to hearing aids and digital wireless telephones. These programs will be coordinated with the digital wireless industry as appropriate.

B. The digital wireless industry will initiate or continue consumer education activities and other outreach efforts to facilitate access to digital wireless telephones by persons with hearing loss. The digital wireless industry also would like to engage in an ongoing dialogue with hearing aid consumers, hearing aid manufacturers, audiologists, and other dispensers of hearing aids to enable the industry to continue to improve accessibility to digital wireless phones for people with hearing loss throughout the product design and manufacturing process.

C. The American Academy of Audiology will educate audiologists and consumers about electromagnetic interference and accessibility considerations for hearing aids, digital wireless phones, and other RF devices.

D. In conducting these educational activities, the parties will take into account information drawn from the reports of the working groups created at the Hearing Aid Compatibility and Accessibility to Digital Wireless Telecommunications Summit Meeting on January 3-4, 1996.

II. INTERFERENCE STUDIES

A. Technical experts identified by the parties will compile the results of studies undertaken to identify an objective level of interference that hearing aid wearers can experience comfortably with digital wireless telephones. Specifically, test results will be compiled from the studies conducted by Mead Killion, Harry Levitt, the University of Oklahoma Center for the Study of Wireless Electromagnetic Compatibility, and other relevant scientific studies.[1]

B. Based on the results of the interference studies, technical experts identified by individuals representing consumer interests and the digital wireless telephone and hearing aid manufacturing industries will reach a preliminary consensus on the objective level of interference that hearing aid wearers can experience comfortably with digital wireless telephones and that will enable the use of the service for basic communication.

C. Based on the level of acceptable interference identified in studies reviewed and vetted, technical experts identified by individuals representing consumer interests and the digital wireless telephone and hearing aid manufacturing industries will develop a preliminary matrix with recommended performance targets for hearing aid immunity and electromagnetic emission levels. This preliminary matrix will be developed within two months of the completion of the studies and will establish a preliminary objective measure of interference that will serve as the interim benchmark until a standard is complete.

D. Thereafter, the preliminary matrix will be submitted to the appropriate standards bodies at such bodies' next regularly scheduled meetings. The industry will take such actions as may be necessary to ensure expeditious review of the matrix for incorporation in applicable standards.

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[1] The digital wireless industry anticipates that the researchers will make every effort to complete the studies that it is sponsoring by July 31, 1996. These studies shall be deemed complete when the principal researchers are satisfied that they have scientifically valid data that is available for review. However, the ability to complete these studies by this date is contingent upon the timely development of appropriate protocols, the scope of the work outlined in the protocols, the size of the studies, and other factors, including factors outside of the control of the digital wireless industry. Accordingly, specific future deadlines are estimates only and are based on the work to be completed in the studies.

III. INTERIM DIGITAL WIRELESS TELEPHONE SOLUTIONS (Within 8 months of completion of interference studies)

To the extent that it is readily achievable, the following will be accomplished:

With the goal of enabling people with hearing loss, including hearing aid wearers, to use digital wireless telephones effectively and comfortably without excessive annoyance from interference, the digital wireless industry will mitigate such interference and enhance usability through the use of interim or permanent solutions. This will be achieved in the following manner:

A. Interference. To the extent that it is readily achievable, there will be a variety of digital wireless telephones that have features that are integral to the design of the telephone and that may include, but will not be limited to, a range of accessories, circuitry changes, changed antenna positions, and/or reduced magnetic emissions, as demonstrated to be effective in mitigating interference.[2] Efforts to mitigate interference will take into account the hearing aid wearer's degree of hearing loss and the varying degrees of immunity in hearing aids.

B. Accessibility. Providers and manufacturers of digital wireless telephone services and equipment also will offer options to provide accessibility to digital wireless telephones for people with hearing loss. Based on the recognition that there are many different kinds of hearing loss, that digital wireless telephones are personal devices, and that there may be many different potential solutions within the definition of accessibility set forth in Section VII below, service providers will work, in the manner that they deem appropriate, to provide accessibility to digital wireless phones for individuals with hearing loss.

IV. COMMERCIAL AVAILABILITY OF LONG-TERM DIGITAL WIRELESS TELEPHONE SOLUTIONS (Within 20 months of completion of interference studies)

To the extent that it is readily achievable, through a combination of further changes to digital wireless telephones made in the manner deemed appropriate by individual manufacturers and through increased hearing aid immunity, the following will be accomplished:

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[2] Features that are integral to the design of the digital wireless telephone may or may not be built into the telephone. Such features may include accessories that are designed for use with the phone or that are distributed with the phone.

A. Interference. A representative cross-section of digital wireless phones will be manufactured and available in the U.S. that have features that are integral to the design of the telephone, including (but not limited to) built-in features, and that limit interference to no greater than the objective level that wearers of hearing aids with increased immunity (see Section V) can experience comfortably with digital wireless telephones.

B. Accessibility. A representative cross-section of digital wireless phones will be manufactured and available in the U.S. that, through features that are integral to the design of the telephone or otherwise, are accessible to persons with hearing loss, including hearing aid wearers. Providers and manufacturers will offer, in the manner that they deem appropriate, various options to provide accessibility to digital wireless phones for people with hearing loss. This Section recognizes that there are many different kinds of hearing loss, that digital wireless telephones are personal devices, and that there may be many different potential solutions within the definition of accessibility set forth in Section VII below.

V. IMPROVED HEARING AID IMMUNITY (Within 20 months of completion of interference studies)

To the extent that it is technologically feasible, a representative cross-section of hearing aids sold in the United States will be available with built-in immunity to electromagnetic interference in conformance with two standards currently being developed by ANSI C63.

VI. ADDITIONAL PROVISIONS

A. Throughout this process and beyond the completion date of this workplan, the digital wireless industry will continue to conduct research with the goal of ensuring increased accessibility to digital wireless phones for people with hearing loss. The research will include continuing to investigate the feasibility of achieving compatibility through internal coupling of digital wireless telephones to the hearing aid telecoil, and testing proposed accessibility solutions against a wide range of hearing aids of various immunity levels.

B. The studies identified in Section II will identify the acceptable level of interference, and this will be submitted for use by appropriate standards bodies. In the event that research demonstrates that bystander interference from digital wireless telephones exceeds this objective level of interference, to the extent readily achievable, the

digital wireless industry, working with hearing aid manufacturers, will seek to mitigate bystander interference.

C. Digital wireless telephones with varying levels of features and capabilities are and will be increasingly available to American consumers. The digital wireless telephone industry recognizes that people with hearing loss, like all consumers, desire access to the broadest possible range of digital wireless telephones, and that they not be limited to only the most expensive and feature-rich, or the most basic and inexpensive, units.

D. The digital wireless telephone industry will investigate the feasibility of standardizing access connections to digital wireless telephones.

VII. DEFINITIONS

A. Accessibility - A digital wireless telephone is accessible to hearing aid wearers if it either: 1) provides compatibility through internal coupling of the digital wireless telephone to the hearing aid telecoil; or 2) provides audibility and intelligibility needed for basic communication.

B. Digital Wireless Telephones - Radio frequency based, wireless telephones utilizing digital transmission formats over an air interface, including but not limited to CDMA, TDMA, and PCS 1900, and regulated under Parts 22 and 24 of the Rules of the Federal Communications Commission.

C. Hearing Aid - A professionally dispensed, wearable air-conduction, sound-amplifying device that is intended to compensate for impaired hearing.

D. Interference - Noise caused by a digital wireless telephone that interferes with a person's ability to use a digital wireless telephone and a hearing aid effectively and comfortably at the same time.